

Appl. No. 10/660,298
Amdt. Dated Nov. 2, 2004
Reply to Office Action of July 2, 2004

REMARKS/ARGUMENTS

Favorable reconsideration of the present application is requested.

Applicant's representative would like to thank the Examiner for the courtesies extended and helpful suggestions provided during the telephone interview of October 7, 2004. A copy of form PTOL-413A, providing details of the interview is attached. In the interview, Examiner asserted that pulping parameters are not clear; the Figure does not show calculation of pulping parameters in step 18 without first determining chemical species in step 16. Examiner asserted that claims to determination of pulping parameters based on only step (i) or (ii) of claim 1 (corresponding to steps 12 and 14, respectively, in the Figure), are not allowable, because both steps (i) and (ii) are required. Applicant's representative asserted that calculation of pulping parameters directly from the results of steps (i) and (ii), without first determining chemical species, is disclosed in the specification. Applicant's representative agreed to delete from the claims derivation of pulping parameters based only on step (i) or (ii), but not both. It is believed that the amendments provided herein are commensurate with the substance of the discussion in the interview in order to put the application in condition for allowance.

The cross-reference to related applications in paragraph [0001] of the specification has been amended to reflect the fact that the parent application, from which the present application is a divisional, is now a granted patent, U.S. Patent No. 6,635,147.

Claim 1 has been amended. In particular, the limitations of claim 4 have been incorporated into step (iii) of claim 1, specifying that the wood pulping parameters which may be determined are selected from the group consisting of Active Alkali, Total Titratable Alkali excluding Metaborate, Sulfidity of the green liquor, Sulfidity of the white liquor, Causticizing Efficiency, Activity and Causticity. However, Effective Alkali and Total Titratable Alkali including Metaborate have been deleted from the list of pulping parameters, because these parameters were derived from step (i) only, i.e. step (ii) was not required.

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Claim 4 has been canceled since those limitations were incorporated into claim 1.

The Figure has been amended to show the method of calculating pulping parameters in step 18 directly from the results of the acid titration in step 12 and the boron or sulfide analysis in step 14. This method is clearly disclosed in paragraph [0028] of the specification, where it is stated that:

"these pulping parameters are derived from the levels of chemical species or directly from the boron concentration and the volumes of titrant from the three acid titration endpoints, according to the following equations"

This method is clearly disclosed again at paragraph [0036] of the specification, where it is stated that:

"The pulping parameters in step 18 are calculated from the levels of chemical species or directly from EP1, EP2, EP3 and V_{H,S}."

In the pending Office Action, claims 1, 2, 12, 17 and 20 were rejected under 35 U.S.C. 103(a) as obvious over JANSON in view of ADMITTED PRIOR ART and in view of CAMACHO, and further citing WO 84/04552. However, it should be noted that there were only four claims in the present divisional application. It is assumed that the reference to claims 1, 2, 12, 17 and 20 is actually a reference to the claims of the parent application. Claims 1-4 of the present application correspond to claims 17-20 of the parent application. Therefore, it is assumed that this rejection applies to claims 1 and 4 of the present application. Furthermore, claim 4 of the present application has now been canceled, so that only claim 1 remains from this rejection.

JANSON teaches the use of borate-containing pulping liquor in a pulping process and ADMITTED PRIOR ART teaches the measurement of hydroxide, carbonate and sulfide concentrations in pulping liquors by the so-called ABC titration method for analyzing hydroxide, carbonate and sulfide concentrations in borate-free pulp liquors. WO 84/04552 teaches using gas chromatography to measure sulfide concentrations in pulping liquors. There is no indication that this method contemplates the presence of borate in such liquors, or any interference therefrom.

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CAMACHO teaches the use of a sodium ion electrode for measuring sodium in pulp mill streams and the suppression of interfering hydrogen ions by pH adjustment when measuring sodium with an ion selective electrode. Examiner asserts that it would have been obvious to one of ordinary skill in the art: (1) to measure the hydroxide, carbonate and sulfide concentrations in the pulping process of JANSON; (2) to use the gas chromatography measurements of WO 84/04552 to measure the sulfide concentration, e.g. sulfide ions, of the ADMITTED PRIOR ART; and (3) to suppress any interfering ions in the measurement of the ADMITTED PRIOR ART based on the teachings of CAMACHO.

However, Applicant's method for overcoming chemical interference is very different from the approach used by CAMACHO. Whereas CAMACHO proposes chemically suppressing interfering species, Applicant's method involves determining pulping parameters in a boron-containing alkaline pulping liquor sample algorithmically (in step (iii)), based on the combined analytical results of two different chemical analysis techniques (from steps (i) and (ii)). CAMACHO makes no suggestion of combining multiple analytical techniques in order to overcome chemical interference. Furthermore, the ADMITTED PRIOR ART and WO 84/04552 do not contemplate the presence of boron in the pulping liquor samples being analyzed, much less how to overcome the chemical interference resulting from the presence of boron.

Therefore, there is no teaching or suggestion to combine the gas chromatography analytical technique of WO 84/04552 with the disclosure of JANSON and ADMITTED PRIOR ART, and no disclosure or suggestion of Applicant's method for overcoming interference due to the presence of boron in order to determine pulping parameters in a boron-containing alkaline pulping liquor sample.

Claims 1-4 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. Specifically, Examiner has asserted that there is no disclosure as to how the pulping parameters can be determined without determining the chemical species. As discussed above, the Figure has been amended to show the method of calculating pulping

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parameters in step 18 directly from the results of the acid titration in step 12 and the boron or sulfide analysis in step 14. As discussed, this method is clearly disclosed in paragraphs [0028] and [0036] of the specification. Furthermore, formulae for determining wood pulping parameters including Active Alkali, Total Titratable Alkali excluding Metaborate, Sulfidity of the green liquor, Sulfidity of the white liquor, Causticizing Efficiency, Activity and Causticity, directly from the results of the acid titration in step 12 and the boron or sulfide analysis in step 14, are disclosed in paragraphs [0035] to [0033] for the method involving sulfide determination in step (ii) of claim 1 and in paragraphs [0030], [0031], [0033] and [0024] for the method involving boron determination in step (ii) of claim 1.

In particular, for the method involving sulfide determination in step (ii) of claim 1 (step 14 of the Figure), formulae for determining the Active Alkali (AA) and Total Titratable Alkali excluding Metaborate (TTA) based on EP1, EP2, EP3 and $V_{H,S}$ are disclosed in paragraph [0036], equations 14 and 15. Activity can be derived from AA and TTA, as shown in equation 20. Formulas for determining the additional pulping parameters of Sulfidity of the green liquor and Sulfidity of the white liquor, Causticizing Efficiency (CE) and Causticity are disclosed in paragraph [0037], equations 17 to 19 and equation 21. These additional pulping parameters may be determined without calculating the chemical species by simply substituting equations 9, 10 and 12 into equations 17 to 21, and again calculating based on the values of EP1, EP2, EP3 and $V_{H,S}$ which were determined in steps (ii) and (ii) in claim 1 (corresponding to steps 12 and 14, respectively, in the Figure).

For the method involving boron determination in step (ii) of claim 1, formulae for determining the Active Alkali, Total Titratable Alkali excluding Metaborate, Sulfidity of the green liquor, Sulfidity of the white liquor, Causticizing Efficiency, Activity and Causticity are determined from an analogous set of equations disclosed in paragraphs [0030], [0031], [0033] and [0024].

Therefore, as discussed above, the claimed pulping parameters can be derived based on the analytical results in steps (i) and (ii) of claim 1, without determining the concentrations

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(quantitative presence) of any chemical species other than the boron or sulfide determination of step (ii).

In view of the above amendments and remarks, Applicants respectfully submit that the invention of the present application is novel and unobvious in view of the prior art and directed to patentable subject matter, and that all claims are now in proper and allowable form. Accordingly, reconsideration and an early notice of allowance are respectfully requested.

Respectfully submitted,

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Attachments

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 Annotated Sheet Showing Changes

